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Mr. Watson  
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REPORT

OF THE

COMMITTEE

ON A VILLAGE OF COTTAGE HOSPITALS,

MADE TO THE

GOVERNORS OF THE SOCIETY

OF THE

✓  
NEW YORK HOSPITAL.

February 24th, 1876.

Printed for the Governors.





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The Committee on a Village of Cottage Hospitals respectfully report :

That in all the hospitals whose records have been preserved, it is found that, although the art of surgery has made great progress, no improvement in the cure of patients has been attained—the average mortality after operations remaining unchanged for thirty or forty years ; and that in small and separate hospitals the mortality diminishes with the size of the building.

In the treatment of disease the same rule holds true ; the nearer the condition of the patient approaches that of a member of a well ordered household, the better are the chances of his recovery.

The most successful hospital, therefore, will be a cottage, and the best general infirmary will be a village of such cottages, surrounded by gardens and not bare of trees. Pure air is the first necessity. Great cities have been supposed to require great hospitals in their midst, so as to receive the large number of sick and maimed persons who seemed likely to require instant relief. In fact, however, it turns out that the patients who are produced by a great city are wonderfully few.

Very many of the inmates of metropolitan institutions

come from more or less distant places. The House of Relief of the New York Hospital in Chambers street receives all comers, whether surgical or medical cases, who apply or who are brought in by the police from the most stirring part of the city ; yet the average number of beds occupied is fifteen, and the aggregate number of resident patients during six months from July 5, 1875, to January 1, 1876, was 149.

At the threshold of their enquiry your committee were met by the not unexpected conflict of opinion of which sanitary science has been the cause.

It will be proper, therefore, to make statements of fact rather than of theory, and to endeavor to deduce from what is established some conclusions that may appear unavoidable.

In the twenty-fourth annual report of the Registrar General of the births, deaths and marriages in England, at page 205, is a table entitled " Mortality per cent. in the principal hospitals of England, 1861."

In 106 such hospitals, the number of special inmates on the 8th April, 1861 was 12,709 ; number of deaths in the year 1861 was 7,227 ; mortality per cent. 56.87.

Average number of inmates of each hospital, 120.

At page 230 of the same report is another table, entitled—

" TABLE XV. Principal general hospitals in England and Wales, 1861." There were eighty general hospitals having a mortality reckoned upon the number of patients present on the day the census was taken of 72.88 per cent.



Five of these hospitals contained 300 inmates and upwards, with a death rate of 100.58 per cent. Four of them contained 200, and under 300, with a mortality of 91.78 per cent.

Twenty-two of them had 100, and under 200 inmates, with a mortality of 70.48 per cent.

The 49 remaining general hospitals contained under 100 patients each, and returned a mortality of 47.08 per cent. The smaller the hospital the greater was the number of patients cured.

"It is evident," says Dr. Farr, in a letter to the Registrar General (p. 231), "from the tables, that the mortality of the sick who are treated in the large general hospitals of large towns is twice as great as the mortality of the sick who are treated in small hospitals in small towns. It remains to be seen whether the mortality in small hospitals is not twice as great as the mortality of the same diseases in patients who are treated in clean cottages."

One of the most recent works on hospitals is a treatise on "Hospitalism and the Causes of Death after Operations," published in 1874 by John Eric Erichsen, one of the most distinguished of living surgeons, and senior surgeon to University College Hospital, in London. "I cannot but think (says he, page 91) there is something radically wrong in the conventional method of constructing ordinary hospitals." "They are simply big houses with every floor filled with sick and injured people. On the ground floor, accidents and operation cases ; on the first floor probably medical patients ;

“above, chronic surgical cases. Who can wonder at  
 “the development of pyæmia below and erysipelas  
 “above? Who would live in an ordinary house thus  
 “filled? Who would expect to preserve his health if he  
 “ventured to inhabit it?”

There is a disease almost peculiar to large hospitals called pyæmia.

It causes the death of one-third of all who expire after amputations for injury ; and of those who have suffered amputation for disease, pyæmia destroys thirty-four per cent. So that it is not too much to say that one-third of all who die from the effects of amputations perish from a preventable cause. In his lecture on Dust and Disease (*Frazer's Magazine* July, 1870), Professor Tyndall shows that the air we breathe is polluted with organic dust. Dr. Parkes, quoted by Erichsen (page 65) found in the air of military hospitals large quantities of particles of cell-tissue from the skin, and perhaps, from the mouth. Into the cut surfaces of wounds this dust from diseased patients, or from infected rooms, falls with the air as it enters the exposed muscle, and a poison, like that of the virus of the snake or the upas tree, is soon absorbed, and kills. Often, after some slight operation, rigors, fever and delirium supervene, and in a few days the patient dies. The autopsy discloses a purulent infection of the blood, a disease, says Chambers, “whose exciting cause is the introduction of “decomposing animal matter into the circulation.” This is pyæmia. No rational origin of it has been found, except in the atmospheric influence which imbues the



newly exposed surfaces, after a surgical operation, with poisonous dust wafted from older and suppurating wounds, or from the walls of long over-crowded wards. Chambers (Art. Pyæmia) asserts that ten per cent. of *all* cases of amputation die from pyæmia, and forty-three per cent. of all deaths, after primary amputation, are caused by it.

Erichsen (p. 29) states that pyæmia caused about fifty per cent. of all deaths after primary amputations of the upper limbs, or forty per cent. after amputations of the upper extremities for all causes; and asserts (p. 28) that this terrible disease proved fatal in thirty-six per cent. of all the deaths of all amputations.

The Lincoln County Hospital, in England, had become so saturated with wall-poison that the governors decided to pull down the building and construct it anew. One of the surgeons, Mr. Brook, said (Erichsen, p. 94), "that the interior of the hospital has, of late years, been "entirely renewed, but still the disease (pyæmia) kept "breaking out." Mr. Lowe, another of the surgeons, stated that although the hospital had become thus pyæmia stricken, he had never met with a case of that disease in the town itself out of the hospital.

In the Norwich and Norfolk Hospital pyæmia has seriously interfered with the success of operations (Erichsen, p. 95), while out of the hospital it is unknown in the neighborhood. "The truth is" says Erichsen, (p. 98), "there is, in these extreme cases only one remedy left, viz., the demolition of the infected fabric and the destruction of its materials."

In maternity or lying-in hospitals the danger to the inmates from a similar cause—puerperal fever—is frightful. Lefort, having compiled the results of two millions of cases of parturition, one-half at the homes of the women, the other half in lying-in asylums, found that :

At home, the deaths were 1 in 212

In hospitals                   “       1 in 32.

The risk being about seven times as great in the best managed institutions, as in the case of a woman who becomes a mother in the poorest habitation or garret.

Puerperal fever has become the terror of obstetrics. Originating in crowded wards, its infection is conveyed in the very hair or finger-nails of the accoucheur to his private patients. No doubt is at present expressed concerning the danger of hospitalism in such cases.

Ovariectomy, one of the gravest of surgical operations, is almost impossible in great hospitals, where the mortality is often seventy-six or eighty per cent. But in private houses, in pure air, Spencer Wells, or Sims or Emmet, lose no more than twenty-four per cent, or even less. Spencer Wells is of opinion that no surgical operation attended with risk to life should ever be performed in a great general hospital in a large town, except under such circumstances as would render removal to the country, or to a suburban cottage hospital, more dangerous (*Diseases of Ovaries*, p. 326).

In the Peninsular war, Dr. Guthrie found that of 291 primary amputations performed in the field, only 24, or 1 in 12, died, while of 551 secondary amputations done



in hospitals, 265, or nearly 1 out of 2, or one-half, perished.

Sir James Y. Simpson has collected some statistics which have drawn forth much criticism. The portion of his tables which is accepted, because it is official, discloses that out of 2,089 amputations performed in large English hospitals, 855, or *forty-one* per cent. were fatal. In country and private practice, he found that out of 2,098 cases, there were only 226 deaths, or *eleven* per cent. These figures have been disputed, but their general accuracy remains uncontradicted, or at least not disproved. The results of the two methods of practice were evidently very different.

There was an epidemic of scarlet fever at the camp of Aldershot, in England, in 1865.\* A report was made by the Army Sanitary Committee, to Parliament, on the 20th April, 1866, in which it is stated that of scarlet fever, among families living in officers' quarters or in permanent barracks, there had been 76 cases, with 21 deaths, or *twenty-seven* per cent. Among the sick who were lodged in tents there had been 19 cases and but one death, or *five* per cent. Subdivision, says the report (p. 23), diminishes the liability to epidemic attacks. Patients who were lodged in tents, were five times more likely to recover than those who were in barracks or in officers' quarters, and the fewer the patients, the better were the recoveries.

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\* Report on the late Epidemic of Scarlet Fever among children in Aldershot Camp, 1866, pp. 38, 39, 40.

The first Dispensary in New York was established February 1st, 1791. In 1796 this statement was published by the Board of Managers.

" 1796.—The following is an exact return of the patients admitted, cured, &c., from the establishment of the institution, February 1st, 1791, to December 22d, 1796, being five years.

Patients admitted.....	2,061
Cured .....	1,623
Died.....	146
Relieved.....	139
Removed to Hospital.....	47
Removed to Alms House.....	27
Discharged disorderly.....	25
Removed out of town.....	7
Eloped.....	8
Remaining under care .....	39
	—————2,061

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JOHN RODGERS, President.

47 of these patients were removed to Hospital.

27    "        "        were sent to the Alms House.

25    "        "        were discharged as disorderly.

7     "        "        had removed from town.

8     "        "        had eloped.

39    "        "        remained under treatment.



The number of sick people to be accounted for was therefore, 1,908 (2,061—153). Among these, 146 deaths having occurred, the mortality averaged more than seven per cent.

Seventy-seven years later, in 1873, the whole number of patients treated by The New York Dispensary was 38,267, and the number of deaths was 88, or about two deaths for each thousand prescribed for.

Of those visited and treated at their dwelling, because they were unable to come to the dispensary, and who were 4,322 in number, two per cent. died.

During the five years, 1854—1858, five of the chief dispensaries in New York city

The New York Dispensary,  
The Northern Dispensary,  
The Eastern Dispensary,  
The Demilt Dispensary,  
The North Western Dispensary,

relieved over five hundred and eighty-seven thousand persons, of whom 4,680 died, or less than eight-tenths of one per cent. 16,788 were sent to hospitals. 115,246 patients were visited at their dwellings, and 472,548 were prescribed for at the dispensaries. About one-fifth, therefore, of all dispensary patients are treated at their dwellings, and of the remainder nearly one-thirtieth are sent to hospitals, either because they have no friend to care for them at their lodgings, or in hope of better nursing.

As the deaths reported, all occur among those visited

at their homes, among the 115,246 persons so visited, 4,680 deaths are to be averaged. This average gives a mortality of *four per cent.*, which is therefore probably very nearly the true death rate of dispensary practice at the bedsides of the poor.

It must be remembered that the relief of infants forms a large part of the work of dispensaries, while few or no infants are admitted into general hospitals.

Nearly one-half of the entire number of children born in New York city, die under five years of age. Yet, notwithstanding the unfavorable burden of infant disease for which dispensaries are responsible, the records of five dispensaries, during five years, show that out of all patients, children as well as adults, treated at their abodes by visiting dispensary physicians, only four per cent. die.

There is reason to think that the mortality is even less. Statistics are often in poor credit, for it is customary to say that dispensary returns prove anything, because they are imperfect.

The New York Dispensary for several years has made use of a careful system of forms and blanks which are filled up by the physicians, and are as likely to be accurate as any case-books whatever. These returns show, that during the year

1870—4,233	patients were visited,	of whom	76	died.
In 1871—4,382	“	“	“	85 “
In 1875—4,194	“	“	“	154 “

The whole number of sick-poor visited at their dwellings during the three years 1870, 1871 and 1875 (an inter-



val of four years being left in order to obtain a fairer ratio), was, therefore, 12,809, with a mortality of 315, or two and four-tenths per cent., which may be accepted as the result of the best dispensary practice.

The records of the New York Hospital cover a period of more than eighty years. About 145,000 patients have been received there, nearly 15,000 of whom have died. During this long period epidemics have succeeded intervals of unusual health, but the death rate has, nevertheless, averaged from 9 to 10 per cent. In 1793-4, the mortality was over nine per cent., and in 1869 it still remained between nine and ten per cent. of all admitted during that year.

The inhabitants of New York city, therefore, who have been ill enough to need medical aid at their bedsides, when patients in the New York Hospital, died at the rate of ten out of the hundred—when treated outside the hospital, at their poor dwellings, they died at the rate of four per cent. In other words, the mortality of those sick persons who were admitted into a hospital was two and one-half times greater than among those who were prescribed for by dispensary physicians at their dwellings.

“The mortality consequent on amputation” (says John Erichsen, writing in 1874), “has certainly not decreased, but if anything, rather been on the increase since Phillips and Lawrie published their tables.” “There has been no improvement during the last forty years”—“a result that is but little creditable to surgery.” \*

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\* Erichsen, *Hospitalism*, p. 6, p. 25.

Mr. Erichsen shows that in the University College Hospital (of which he is chief surgeon), although immensely improved hygienic arrangements have been adopted, the amputation mortality remains exactly as it was twenty-five years before he wrote,\* or about twenty-five per cent.

Dr. Morton, of Philadelphia, in 1875, reports that in the Pennsylvania hospital 902 amputations were followed by 230 deaths, or twenty-five per cent.

Dr. Fenwick (Transactions of Social Science Association for 1867, p. 115) states that the rate of mortality in nearly five thousand cases, is one out of every three, or 33 per cent.† At page 356, of Sir James Y. Simpson's work on *Anæsthesia, Hospitalism, &c.*, Edinburgh, 1871, is a table of the percentages of death after limb amputations under different conditions and degrees of aggregation and isolation—

CONDITION AND SIZE OF HOSPITALS.		PERCENTAGE OF DEATH RATE.	
In the large Parisian hospitals	- - - 62	in	100 die.
In British hospitals with 300 to 600 beds,	41	"	"
" " with 300 to 201	" 30	"	"
" " with 200 to 101	" 23	"	"
" " with 100 to 26	" 18	"	"
" " with 25 beds or less	- 14	"	"
In isolated rooms in country practice	- 11	"	"

With facts like these before him, Spencer Wells declares that "the surgeon who hopes to obtain better results than have hitherto been obtained, must place

\*P. 104.

† *Anæsthesia Hospitalism, and other papers*, by Sir James Y. Simpson, 1871, p. 291.



“his patient as nearly as possible in the position of a person in a private house, in a healthy situation.”\*

In the 16th and 25th Reports of the Registrar General of England, it is shown by tables of the ratio of deaths to the density of population for twenty years that the death rate increases directly with the density. Where 250 inhabitants lived on one acre of ground, one in 18 died, but where each person occupied or averaged twenty-five to thirty-eight acres, the death-rate fell to one in sixty-two.†

In the fifth annual report of the State Board of Health of Massachusetts, Dr. George Derby points out the failure of “l’Hopital Lariboisiere,” in Paris, with its high rooms and pavilions, and its enormously complicated system of artificial ventilation, and concludes from a large array of authorities that hospitals should avoid aggregation of the sick, and seek the safety of their inmates in their segregation, because he finds that the mortality of hospitals increases with the number of their occupants.

After describing the army hospital devised by the surgeons of the United States, which proved so successful, the report attributes that success to the fact that the soldiers got, within those army buildings, that most powerful of all remedial agents—fresh air.

In circular No. 6, from the Surgeon-General’s office, is an account of the Lovell Hospital, at Portsmouth Grove, which was situated upon Narragansett Bay, in Rhode Island—and was composed of twenty-eight

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\*Medico Chirurgical Transactions, Vol. VI.

† 5th Report, State Board of Health of Massachusetts, page 368.

wooden pavilions or wards. It was opened in July, 1862, and closed October 10th, 1865.

During these three years, severe winters were passed by the patients in temporary structures, with a mortality of three per cent. for the whole period of occupancy.

11,696 white soldiers were received, of whom 8,491 were sick, and 3,205 wounded; of all these soldiers, 2,461 were transferred to other hospitals, leaving 9,235 to be accounted for.

Returned to duty. ....	4,386
Mustered out at close of the war. ....	875
Deserted or failed to return from furlough. ....	961
Discharged for disability. ....	2,021
Transferred to Veteran Reserve. ....	716
Died. ....	276
————	9,235

And out of this number only 276, or three per cent. died. Well may Dr. Roosa, in his anniversary address before the New York Academy of Medicine in 1874, say of these United States army hospitals, devised and carried on under the management of medical men: "they have become the models for the World."

It is very instructive to compare the recent statistics of the army and navy hospitals of the United States with those of the sea service of Great Britain, as described by John Ranby, Esq., surgeon-general to the British army, and given in a treatise on gunshot wounds, reprinted at Philadelphia, 1776. "If it be true," says he

(p. 163), "as was published in December, 1760, taken, as  
 "is supposed, from returns made to the House of Com-  
 "mons, \* \* \* out of 185,000 men raised for the sea  
 "service, during the late war (with France), above  
 "130,000 perished by diseases safely charged to the  
 "account of diseases that take their rise from putrefac-  
 "tion."

One hundred years before our civil war of 1860, in the British navy, 130 out of every 185 seamen, or seventy per cent., are thus said to have perished of disease alone.

In the marine hospital service of the United States, during the year 1873, 13,549 sick sailors were treated, and the mortality among them was five per cent.

During the civil war of 1861-1865, in the land service, the United States army hospitals treated over one million of cases, with a loss by death of eight per cent.

General Wm. T. Sherman, in his "Military Lessons of the War," vol. II, page 393, asserts that "the tent  
 "or shelter of a tree is a better hospital than a house,  
 "whose walls absorb fetid and poisonous emanations,  
 "and then give them back to the atmosphere."

Dr. Sutherland and Captain Galton, define a hospital to be a building for the reception and treatment of sick persons under conditions of recovery more favorable than such persons could otherwise command.\*

Sir James Simpson points out "that the great disin-  
 "fectants and antiseptics that we should alone depend  
 "upon, are abundance of space, abundance of light, and

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\* London Lancet, March, 1874,



"above all, abundance of pure and ever-changing air." \*

Can these conditions of cure be furnished in a city hospital ?

The trustees of the Johns Hopkins' Hospital, to be built in Baltimore, have lately published five reports, made to them by several eminent surgeons and physicians, upon the construction and management of hospitals. The general advice given to the trustees, by most of the writers of these reports, is, to occupy the fourteen acres of ground dedicated by Mr. Hopkins to his hospital, with permanent buildings. Drs. Billings, Folsom and Stephen Smith, prefer one-story pavilions.

Dr. Jones, of New Orleans, recommends substantial structures, and insists upon solidly built, warm and differently heated wards. Dr. Caspar Morris urges that one-story barrack buildings are as Utopian as a village of cottages. All the writers demand pure air and light as essential. And the argument against rural cottage treatment is summed up and formulated by the word "*city*," which is held to express a necessity. Citizens give up, it is said, unavoidably, some advantages in the way of health for other compensating advantages, and when sick, city people must have their city hospitals. The remarkable success of army huts and tents is accounted for, by Dr. Jones, on the theory that what might be well for hardy men in the field, could not be endured by the enfeebled inhabitants of the sheltered lanes and alleys of a city. Now, it escaped the recollection of the authors, that all soldiers begin as civilians, who leave their homes

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\* Dun's Memoirs of Sir James Y. Simpson, 1873. Page 520.

in sheltered lanes and alleys, or in snug farm-houses, heated by air-tight stoves, and who almost universally fall sick soon after they are enlisted. In order to become the hardy, robust soldiers for whom only cottages "might be" sufficient hospitals, all recruits must first have passed successfully through the very treatment in army hospitals and tents which is deprecated as destructive to enfeebled citizens. It is, however, conceded in these reports that a village of cottages would return a percentage of mortality vastly less than that supplied by crowded wards, just as a rural district or village is healthier than large towns ; but the idea of temporary hospitals is said by Dr. Caspar Morris (p. 189) "to be "only compatible with the savage tyranny of Central Africa."

During the civil war it was found that regiments raised wholly in cities and made up of the very men from sheltered lanes and warm alleys, endured the exposures of the campaign far better than sturdy lumbermen or farmers. The countryman perished under the close barrack life and weary restraint of army discipline, while the citizen, inured to foul odors and the worry of streets, survived hardships which merely continued the restless tension he had always felt. In the field the advantage of the citizen was greater. Pure air and outdoor life gave him new vitality ; but the countryman found, even on the march, no unaccustomed stimulants in sunlight and wind ; and so he pined under the depression of a soldier's duty, fell sick, and died.

Country regiments were found to consume more recruits than city regiments.

To the citizen in the army, more than to the stalwart countryman, when sick, pure air and breezy hospitals were the *Elixir of Life*; and the warmer wards in well built hospitals, demanded by one of the Baltimore reports, often proved real calamities to the soldiers who had been carried into them.

Dr. Shrady's *Medical Record* has recently published some remarkable editorials upon hospital construction. In the *Record* for February, 1876, it is argued that "if a physician had twenty houses opposite each other, in the same street, each surrounded with spacious and neat court-yards, and twenty sick patients in each house, he would not consider it embarrassed administration to have to pass from one to the other without a corridor. A hospital may well be looked upon as a village of sick persons instead of a massed hotel." The true method is, household administration as well as household separation. In an immense boarding-house the plan of the apartments may be made subservient to facility of administration, as the ruling idea, but not in an hospital.

The remarkable fact is next pointed out, that Florence Nightingale insists on the separation of nurses as part of the proper arrangement for segregating the sick, and that she shows the danger of allowing attendants to meet in a common dining-room, in the same dress in which they had been handling erisipelas or typhoid fever, or suppurating wounds. The nurses of each separate



cottage ward should be attached to that particular house and live there. There should be a fever ward built, and then a diphtheritic ward, and a casualty ward, and so on, one by one ; each building should be rendered complete in all its appurtenances,

“*The Record*” infers that any hospitals built thirty years ago should be studied mostly to find out what a new hospital should *not* be, and predicts that the “household system will yet come to be the prevalent idea of hospital construction and management. We want a neat hospital village in which each classified kind of disease has its home.\* Then let it be regulated and administered as would be the household of a man and his wife, \* \* \* with ample means for proper nursing and care ; \* \* \* these things promise more than one grand administrative building with corridor connections to divers offsets, with general assembly rooms for attendants, with an all-pervading heating and ventilating apparatus ; and a sewerage which links them all into one.”

In the discussion which took place at Leeds, at the meeting there of the British Medical Association, July 29th, 1869, Dr. Rumsey described the magnificent hospital at Netley, and spoke of the first announcement of an horrible smell arising from the opening of an abscess, being made, loudly, from a ward at the other end of the corridor, a third of a mile distant, showing that the putrid air had been carried by the corridor to that dis-

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\* *Medical Record*, No. 276, Feby. 19th, 1876. Art. : *Hospital Construction and Organization*, by Dr. Ezra M. Hunt, of New Jersey.

tance. This fact completely explains the apparent paradox that newly built additions to old hospitals, as in London recently, are sometimes more deadly than the oldest structures. The new portion being usually furnished with ventilating and heating flues, the air rushes towards them, out of the older and empoisoned wards, and is then poured upon the inmates of the distant beds. The air current is of course loaded with the disease-dust, which was evident to the smell, at Netley, but which is oftener unnoticed. Yet it has been contended that old hospitals are unjustly condemned, because the mortality in freshly built additions is higher than in the older wards to which they are attached.

During the same discussion upon Douglas Galton's address, at Leeds,\* Dr. Evory Kennedy, of Dublin, said that "we are still in our infancy in our investigation of those laws which bear upon hospitalism. Yet the Jews were familiar with some of those practical influences that are only now opening upon us." In *LEVITICUS*, Ch. XIV, minute directions are given for the detection of a plague in the house walls. The stones in which the plague is shown by discoloration, are to be removed to a place without the city, and other stones and new mortar must be used to repair and replaster the wall.

But if, after such partial purification, the plague be spread in the house, it is unclean. The house must then be broken down, and the stones and the timber, and all

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\* An address on the general principles which should be observed in the construction of hospitals, by Douglas Galton, C. B., F. R. S. London, Macmillan & Co., 1869.

the mortar are ordered to be carried forth out of the city, into an unclean place.

The wisdom of the Judaic Health-Law has been recognized in our days, and the Lincoln County Hospital, in England, plague-smitten and saturated with pyæmia, has lately been totally destroyed, according to the antiquated injunctions of Leviticus. The best science of English surgeons now accepts as true the learning of the Hebrews.

If the preservation of life be the object of surgery and medicine, something else is to be sought than successful operations and correct diagnosis of disease. We must supply to our sick poor *good nursing*, which is everywhere recognized as essential to recovery. This can only be had where the air is pure, where patients are isolated, or at least classified, and where cleanliness is perfect. Duty to the well forbids us to plant, in a dense neighborhood, a closely packed general hospital, full of various diseases. From such a concentrated atmosphere of sickness, new maladies have arisen, and have invaded adjacent dwelling-houses. "Every diseased person is now to be regarded as an element of more or less danger to those about him." The best hospital is that which is the nearest approach to a home, and where the fewest sick people are in one place. These are the views of Dr. Derby, in the 5th annual report of the State Board of Health of Massachusetts, p. 328.

Dr. Stephen Smith says that hospitals may expose their inmates to new and fatal diseases. Patients enter



general hospitals with simple and curable troubles, but contract other maladies of a more fatal character, of which they die.\*

The disadvantages against which city hospitals must contend, may be inferred from the broad fact that there died in the year 1861-2, of all ages, in twenty-seven English agricultural districts, out of every thousand, 21.4.

In the four chief cities of England, of all ages, there died out of every thousand, 40.7.†

The healthfulness of the population of *rural* England was therefore about twice as great as that of *citizens*.

Diseases of the lungs are found to be twice as fatal in great cities as in the country.

By the United States Census, of 1860, it appears that in the whole United States there was one death to every 78.3 inhabitants. By the census of 1870, there was one death to every 79.7. In New York city in 1870, there was one death to every 39.3 inhabitants. In Philadelphia, from 1861 to 1871, the rate was one death to every 31.9.‡

American cities are thus shown to be, like those of England, twice as unhealthy as country districts, and it is certain that in the two great English-speaking nations those who live in cities give up half the health and much of the longevity, which, by spending their days in the country, they might enjoy.

\* "Principles of Hospital Construction," by Dr. Stephen Smith, p. 4.

† Dr. John Stockton Hough, American Public Health Reports, Vol. I, pages 123-129.

‡ Public Health Association [Reports and Papers in the year 1873], p. 125.

If, then, the entire population of cities, most of whom are in health, fare so badly, what becomes of the sick? The evidence is not wanting, that in surgical cases, *all other things being equal*, the cures are more than four times as many in the country as in town. And the question narrows itself to this: Can we, by help of the easy locomotion at our command, by rail, by steamboat, by properly equipped ambulances, transport the sick and wounded of a great city in safety to the pure air and ample space of the country, where the probabilities of recovery are at once *doubled*?

For, twice as many get well in country sick-rooms as can be saved by city treatment, no matter how skillful or luxurious.

According to the census of the U. S. in the year 1850, the percentage of deaths to the whole population was 1.41.

In the year 1860, it was 1.27.

In England, the Registrar General gives the mortality, in the year 1861, of the population of all England, as 2.16 per cent.

The U. S. census returns make it very probable that one twenty-third part of the entire population is constantly sick.\* Of these sicknesses very many are preventable, and their prevention ought to be the object of true and intelligent benevolence.

Dr. Caspar Morris gives the mortality of the city of Philadelphia at nearly 2.5 per cent., or almost the same as that of all England. The health-rate of all the United

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\* Preliminary Report on the English Census, by Jos. C. G. Kennedy; p. 114.

States being but 1.27 per cent. (one-half that of the healthiest city), it appears that our country is twice as healthy as England, unless three successive decennial census reports are false.

Dr. Forry, in his work on the climate of the United States, published in 1842, quotes a letter appended to the first annual report of the Registrar General of Great Britain, in which a comparison is made among seven millions of persons, one-half of whom dwell in towns and the other half in counties. The mortality from epidemic diseases and disorders of the nervous system is doubled by the concentration of population in cities. In towns, as compared with counties, the mortality from consumption is increased thirty per cent.; from child-birth, seventy-one per cent., and from typhus, 271 per cent. (page 369).

General Walker gives the mean average duration of human life in the whole United States, in the year 1870, at thirty-nine and a quarter years, while in the cities of New York and Philadelphia it was only twenty-three years.

In presence of such facts as these can nothing be done to change for the better that dismal "41 per cent." of deaths after surgical operations in city hospitals, which Erichsen has shown to have stood for forty years unimproved?

Many small village hospitals have been opened in the towns and villages of England, in which persons in poor circumstances, paying a very trifling fee, are cared for by the supplementary aid of wealthier neighbors.



The sanitary results of these little infirmaries have been surprising. "In cottage hospitals," says Dr. Swete, Handy Book, p. 40, "the air admitted is of the purest quality, for the lattice windows and ill-fitting doors allow fresh air to pass through the rooms, and in these small places are rarely more than two beds, the mischief increasing in ratio to the number placed in the same room"

Forty-six cottage hospitals in England during the year 1869, averaged six beds each. In these institutions 207 surgical operations were performed with a death rate of 6.7 per cent. The whole number of medical and surgical cases treated was 3,191, with 144 deaths, or a mortality of about *four* per cent. Now, the death rate in the great English city hospitals in the year 1868, after amputation, was not less than 41 per cent. In the University College Hospital, in London, the same operations were attended by 25 per cent. of deaths. In the Pennsylvania Hospital, 24 per cent., and in the Massachusetts General Hospital, 26 per cent. of all amputations were fatal.

Dr. Swete's tables do not present the separate statistics of amputation in more than one of his cottages, and a comparison can therefore only be made between the mortality among all cases treated in 46 cottage hospitals, which was *four* per cent., and the mortality among all cases treated in the best American institutions, such as the "New York Hospital," where it has during eighty years averaged *ten* per cent. Singularly enough, this

proportion is the same which exists in New York between dispensary and hospital practice.

In the words of the celebrated John Simon, well known in sanitary science, "So thoroughly does a hospital depend for its usefulness on the capacity of its wards, for the most exquisitely perfect ventilation, that in all plans of hospital wards this is the one cardinal virtue to be insisted on."

To this ventilation, unconsciously perfect, the English cottages probably owe their success.

The most determined enemy of small hospitals is Dr. Duncan, of Dublin, whose work on the mortality of childbed and maternity hospitals directly opposes the ideas entertained by Erichsen and Simpson. Dr. Duncan admits (p. 5) "that all attempts at ascertaining scientifically or exactly the mortality must be given up." Yet after many nice distinctions between the deaths occurring *in*, and those *of* childbed, and after his admission of absolute uncertainty as to results, we are called on to believe, on his authority, that there is no harm in the aggregation nor benefit in the separation of maternity cases. Le Fort (*Des Maternités*, p. 63,) says that several English accoucheurs in private practice have found a total mortality of not exceeding 2 or 3 in 1,000. Dr. Duncan affirms that not fewer than 1 out of 120 out of *all* deliveries die—or almost four times as many as Le Fort records. Which of the doctors is to be believed?

The war of medical opinion is nowhere so oddly waged as over these statistics of maternity. According to Erichsen, "It is absolutely impossible to establish a ma-

ternity ward in a general hospital without exposing the women confined in it to the greatest possible peril of life. (*Hospitalism*, p. 43). "The fact is certain that a  
 " woman has a better chance for recovery after delivery  
 " in the meanest, poorest hovel than in the best con-  
 " ducted general hospital, furnished with every appliance  
 " that can add to her comfort, and with the best skill  
 " that a metropolis can afford."

According to Dr. Duncan (p. 113), Le Fort's statement of the mortality in hospitals (which Dr. Duncan quotes as one in twenty-nine), "is a fearful, but" he believes, "a true statement." He then asserts that to judge hospitals aright, the proper course is evidently to take the best as an example, and he cites the Dublin Maternity Hospital, with a mortality among mothers of only one in a hundred. In private practice, he says, the loss is 1 in 98, 1 in 105, or even 1 in 45, and he affirms that in a well managed hospital the mortality appears to be less than in the best private practice. But this is not true in Russia, for in the *Transactions of the American Medical Association* for 1866, it is shown that at St. Petersburg, the deaths in puerperal cases are, in hospitals, 1 in 23; but among patients at their dwellings, 1 in 152.

The method of Dr. Duncan is just as though in order to estimate the healthiness of a city, the cleanest ward, having fewest tenement houses, should be selected as the true type of the whole city. Certainly all the wards of the city must be included in any fair estimate of its sanitary condition. And in like manner, in order to



measure the mortality in maternity hospitals, it is necessary to take the average of the greatest attainable number of such institutions. In admitting the correctness of Le Fort's statement, that averaging all maternity hospitals, the majority was 1 in 29, Dr. Duncan establishes the rule. The exception in the case of the Dublin hospital only proves the truth of that rule, according to the adage. Dr. Duncan's denial of the hurtfulness of large hospitals, and Erichsen's or Simpson's, or Le Fort's opposite statements are to be viewed by the light of the concentration of facts which have been collected by those who have no theory to support or defend. These facts have been gathered by the census-takers of the United States and of England, and they agree in pointing out the principle, that in the aggregation and crowding of the sick, there is large death rate and danger; but in the fewness and distribution of patients there is small mortality and cure.

Dr. Duncan, of Dublin, denies that the number of deaths in the maternity hospital increases with the number of inmates. Dr. Evory Kennedy, also of Dublin, maintains precisely the contrary. Such contradiction between local observers serves to show the necessity of long continued study of many widely separated cases, in order to reach a useful result. Careful observations of the weather, made over thousands of miles by many different men, and simultaneously registered by telegraph, have rendered it possible to know the coming of a storm, and to watch the progress of a distant gale which will probably be felt next day at the place where we are when the

message arrives. So, in sanitary science, statistics do teach facts, provided only that the observations compared be so numerous and widely diffused as to make truth more probable than error.

Obviously, any useful inference in regard to the benefits or evils of any method of hospital treatment can only be reached through large averages of many cases, and they show, as we have seen, this result :

#### DEATHS AFTER AMPUTATIONS.

* In the large general hospitals of France . . . . .	62 per cent.
In all the large hospitals of England . . . . .	41 “
In country practice . . . . .	11 “

So important is a clear demonstration of fact in disputed statistics, that the latter statement, with regard to cottages, ought to be confirmed by hostile authority. Mr. Simon, the medical officer of the privy council, and a defender of large hospitals, points out that “in the London hospitals the special death-rate from amputations is half as high again as in country hospitals,” thus admitting that country hospitals are twice as successful as metropolitan ones,† and confirming the general conclusion derived from the Census, that health and life in the country are twice as good as in the city. But this statement is far short of the truth. Sir James Simpson has collected, in his work on Hospitalism, p. 399, a number of returns from the English hospitals, showing

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\* Sir James Y. Simpson, *Hospitalism*, &c., London, 1871, p. 356.

† “ “ “ “ p. 291.

the relations between the crowding of patients and the mortality among them :

SIZE OF HOSPITAL.	DEATH RATE.	PER CENT.
1st SERIES.—In large and metropolitan British Hospitals, containing from 300 to 500 beds or upwards, out of 2,089 limb amputations 855 died.....or 1 in 2.4		41.
2d SERIES.—In Provincial Hospitals, containing from 201 to 300 beds, out of 803 limb amputations 228 died.....or 1 in 3.5		29.
3d SERIES.—In Provincial Hospitals, containing from 101 to 200 beds, out of 1,370 limb amputations 301 died.....or 1 in 4.4		23.
4th SERIES.—In Provincial Hospitals, containing from 26 to 100 beds, out of 761 limb amputations 134 died.....or 1 in 5.6		18.
5th SERIES.—In Provincial Hospitals, containing 25 beds or under, out of 143 limb amputations 20 died.....or 1 in 7.1		14.
6th SERIES.—In British private country practice, where the patients operated on lay in single or isolated rooms, out of 2,098 limb amputations 226 died.....or 1 in 9.2		11.

The statements contained in the 6th series have been contested, but a comparison between this table and that given by Dr. Graham in the twenty-fourth annual report of the Registrar General of England, at page 205, and quoted above, will abundantly prove that the same principle is established by different methods. Both authorities agree in showing that the smaller the population of any hospital, the fewer were the deaths in proportion to the inmates.



Sir James Simpson finds the best success in country practice. Dr. Farr expects it (24th Report, Appendix, p. 231).

Sick people, then, do recover in less time and in larger numbers under home treatment in country air. The "next best" way to cure them, will be that method, which also in country air most resembles a home.

The New York Hospital began a century ago with eight-bed rural wards, remote from the crowded city—for at that time one of our surgeons, Dr. Tillary, resigned because the hospital was too far out of town. The cow pastures lay around our buildings, and a duel was fought quite in the woods near "Ranelagh"—behind our five acre lot, where Church and Duane streets now cross each other. Our hospital will but resume its foremost place among sanitary institutions, when in establishing once more cottage treatment for the sick poor, it shall fully develop its earliest plans. The ideas of John Howard, Dr. John Jones and Surgeon-General Tilton, of the army of 1776, were those which it is now proposed to revive. With houses of relief in the city, our general hospital ought to be in purer air than the crowded streets of a metropolis can afford. But are such things possible?

The cost of relieving the sick in hospitals is either in the expensive edifices they occupy—equipped at large outlay of money, with elaborate and scientific apparatus for heat and ventilation, and with contrivances for nursing many patients by few attendants; or the sick may be cared for in cheaper buildings in the country with

more expensive diet, with subdivision into many families, and abundant nursing. At the same cost, we ought certainly to adopt that kind of treatment which saves most lives.

It happens, however, that in this case duty and profit go together. The cheapest way is the best in all ways.

We need cheap—not large—buildings, ample space of ground, with abundance of pure drinking water, and some trees. The difference between the capital sum which would be “fixed” and absorbed in constructing a large infirmary in town, and the amount of money which would suffice to pay for and equip a village of cottage wards in the country, will support generously out of its income, when invested, a large number of free beds.

The sagacity of Dr. Woodworth has pointed out and adopted, as the proper type of the best marine hospital, the wooden structures to be erected at San Francisco. There, at an outlay of only \$58,000, an ample infirmary with all proper accessories will be constructed, in which the same number of seamen can be treated as in either of the great U. S. hospitals that have cost, each of them, ten times as much, and with far better prospect of cure.

By the purchase of some land, costing not over \$30,000, on the shore of the navigable waters in our neighborhood, and near a railway, within an hour or two of the City Hall, our Society may obtain the site, the cottages, executive buildings, fences and outbuildings, for one hundred thousand dollars.

The House of Relief, in Chambers street, now costs

about \$1,200 per month, and as this covers salaries of physicians and staff, a dispensary, and the free maintenance of fifteen patients constantly present, each bed requires \$80 monthly. Each patient in a village of cottages, is not likely to cost so much, because in the marine hospitals of the United States the expense per man is but one dollar per day, or \$30 per month. Doubling the price then of maintaining a sailor, we shall be able to support one hundred beds in the most complete manner for less than \$80,000 a year. As two millions of dollars would be a not improbable estimate of the cost of the land and edifice necessary for a first class metropolitan hospital, such as was formerly contemplated, it is apparent that after paying for the village of cottages and its complete equipment the sum of \$100,000, there will remain nineteen hundred thousand dollars for investment as the difference between the value of the city and of the suburban hospitals.

The interest on this investment at six per cent. will much more than maintain one hundred beds at the very high rate of \$2 each per day, making a yearly outlay for the village hospital of about \$80,000, out of an income of \$114,000, or six per cent. on \$1,900,000.

That these estimates are not excessive, at least in so far as relates to the cost of a general hospital in the city. the experience of this Society, in regard to the plans for an asylum for the Insane at White Plains, may prove ; for in that case the main building called for \$1,200,000 without including fences, outbuildings, conservatories or water supply.



By the adoption of the measures recommended by the committee on a house of Relief, February 3d, 1874, the governors have inaugurated with success the policy of small reception houses. The Chambers street police station, fitted up as an hospital, is found more than sufficient for all severe cases, or perhaps for any cases of illness or accident occurring down-town ; but it is already evident that purer air and more quiet must be given to our patients if we would bestow on them the full benefit of the admirable surgical and medical care which they receive. A village of cottages within easy distance by rail or steamboat may be made at once the cheapest and the most successful hospital with which any large city has been blessed. For it will assuredly save many lives and spare many weeks of needless but lingering suffering to invalids.

The indigent will then enjoy alike with his wealthier brother the coveted but nameless benefit we all recognize under the phrase " going into the country for change of air."

Bellevue Hospital furnishes strong proof of the evils of crowded wards. In a report by its medical board, concerning the surgical cases treated there from January, 1872, to June, 1873, it is stated that the number of amputations (excluding those of the toes and fingers) was 58, recoveries after amputations 30, deaths 28, or 48 per cent. At the two reception hospitals, appendages to Bellevue, the results were even worse. In Centre street, or Park Hospital, the total number of amputations since opening the house in 1870, was 23 ; recovered 8 ; died 15.

Seven deaths were caused by pyæmia after operations; percentage of deaths, 65.

In the Ninety-ninth street reception house there were eight amputations, three recoveries, and 5 deaths, or 62 per cent.

Houses of reception, although small, may be dangerous as surgical wards, because of the great number of sick people continually passing through them. At Centre street, "Park Hospital," in the single year 1873, three thousand five hundred patients are reported, twelve hundred of whom were important surgical cases, although there were only thirty beds. All these migratory inmates leave more or less disease-dust; every bad case adding something to the poison upon the walls and bedding, until the concentration of accumulated infection becomes deadly. Here is the solution of the mystery, that some very large hospitals show more cures than some very small ones. When patients change often, and a multitude of diseased men enter, stay a while, depart, and are succeeded by others, they saturate the wards large or small, after a time, with a poison which is now recognized under the name *hospitalism*. This evil is not dependent so much on the size of the ward as on the number who use it. Where in large hospitals many sick people live long together, it is found that the same evils arise as in small houses in which greater numbers of patients successively occupy a few beds even for a short time. When more than half the cases in any surgical ward, large or small, are open or suppurating wounds, pyæmia is very certain to appear.

Houses of Relief must therefore be strictly reception houses only, and must be emptied as often as possible into receptacles better suited than city infirmaries, to cure those who have received what the French surgeons aptly name "the first succour."

These receptacles should be in the country, for the census and the registry of vital statistics have made it probable that Sir James Simpson was not a mere theorist. He found, that the experienced country surgeon, operating upon his patients in poor cottages and villages, is, as compared with the experienced city surgeon, operating in rich and magnificent hospitals, *five times more successful*.\*

Dr. Woodworth, Supervising Surgeon of the Marine Hospital Service of the United States, in his annual report for 1873, quotes the case of wall poisoning, laid before the French Academy of Medicine in 1862, where an analysis of the plaster taken from an hospital wall gave forty-six per cent. of organic matter. Dr. Woodworth maintains that "the most economical mode of hospital construction is really the safest for the sick ; and he recommends separate detached buildings of wood, one story in height, constructed with the view of destroying them, so soon as the peculiar hospital diseases, erisipelas, pyæmia, gangrene, &c., are engendered by the cumulated miasm of the patients (p, 53), usually after ten or fifteen years."

The depressing influence upon each other, of the

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\* Memoir of Sir James Y. Simpson, Bart., by J. Duns, &c., Edinburgh, 1873, page 513.

suffering or the dying in a hospital ward, causes many an unnecessary decease. Quiet and cheerfulness in the sick room are exacted by the physician in private practice. Must these things be given up, in hospitals, for the sake of the supposed necessities of easy administration? Can the sick be conveyed without danger from the unwholesome city to the open country, where, in cottages, each family of invalids may be cared for by a house-mother, as the Germans call such a nurse, who gives her patients home treatment? This ought not to be called impossible until it has been tried. Dr. Fayette Taylor, surgeon to the *New York Orthopaedic Dispensary*, holds that hospitals came in during a state of things which has long ceased to exist, and thinks it high time that our methods of assistance should be improved to correspond with the social advance in other directions.

Railroads and steamboats have changed the manner of our lives within the past sixty years. Journeys are now measured by time, rather than by distance. For the transmission of intelligence, the electric telegraph has furnished a way which overcomes time and distance at one step. Our forefathers who built for the charitable reception of the sick poor what Erichsen irreverently calls "big houses," never imagined such things as railways or steamers, or telegraphs.

Now, that such wonders are accomplished for the well, shall not the sick share the benefits of modern discovery and invention?

The transportation of wounded men is always going on in war, and they endure the rough handling wonder-



fully well. In puerperal fever, patients from the Nursery and Child's Hospital have been removed, while the fever was on them, to Staten Island, and the women recovered and were saved.

No progress has been made in English hospitals for forty years, notwithstanding the vast advantages conferred upon modern surgeons by the use of chloroform and ether. Operative skill has long ago reached a very high degree of accomplishment. Yet surgeons continue to lose almost half their amputations. And the highest authority, Erichsen, in 1874, asks (page 25), "must hospital surgeons ever remain content with losing from one-third to one-half of *all* their amputation cases, and nine-tenths of some?"

"Is this frightful death-rate beyond the control of our science, or is it dependent on causes that are preventable?"

Must American surgeons be also content? Shall we not rather venture to try whether *after treatment* in pure air may not be what European surgery is waiting for?

May not the Society of the New York Hospital still remain at the front of the battle against disease and pain? and by availing itself of its opportunities, give back to life *half* of those ready to perish from sickness, in city hospitals, and four out of every five of those mutilated trophies of the surgeon's skill who now expire unnecessarily. For—"the *operation* has succeeded admirably but the *patient* is dead"—is very often the answer we, too, must return to the enquiring friends of

our patients who have been “discharged” by death from our city hospitals.

Rural hospitals are called Utopian. They are objected to because patients will not go so far from their friends ; because physicians and surgeons will not visit them ; because patients cannot bear the fatigue of transportation ; because the administration will be too costly ; because clinics for the instruction of students will be no longer possible.

Those who have faith in cottage wards in the country, consider their advantages to be—that twice as many lives (at least) will be saved.

—That the cost of land and buildings will be not more than one-tenth, perhaps one-twentieth, of a metropolitan hospital containing the same number of beds, so that the *rent*, as represented by the interest expended for land and buildings will be but a small fraction of the rent of a correspondingly capacious city institution ; the amount saved fully paying for expensive administration ;—that patients are likely to go willingly, with free passes, to a village within an hour or two of town, where their friends could visit them in the same way.

—That consultations could be held with no greater loss of time than in the city, distance being no longer the difficulty, but time only.

—That clinics would be held, free railway or steamboat passes being furnished to students who would throng to see the place where twice as many sick people recovered as in any city hospital, and to find out the reason why.

A resident physician of first-rate ability would be always present, as in our asylum for the insane.

The transportation of the sick could be in cots suspended with rubber elastic slings inside the ambulances, so securely that the patient need never feel a jolt. His bed carried by the elevator in the reception house to the street level, can be placed in the ambulance, and so slung by elastic loops, that during the drive no jar can occur. Reaching the water side or the railway station, the cot, in like manner, can be conveyed throughout the journey, until at the end of a couple of hours the invalid has exchanged foul air and depressing sights and sounds for the freshness and cheerfulness of a country welcome to a sunny and pleasant cottage room.

Bad roads and springless wagons are no longer unavoidable things. Nothing can well be more severe than the shaking endured by those conveyed in the present ambulance over our rough streets to the hospitals in Fifty-ninth or Seventy-third streets, or even to Bellevue. Better carriages for the sick are not hopeless inventions.

There is nothing new in the cottage hospitals we recommend. Thirty years ago Sir James Y. Simpson had often taught that if "our present hospitals were changed " from being crowded palaces, with a layer of sick on " each floor, into villages or cottages with one, or at most " two patients in each room, a great saving of human " life would be effected," and he recommended at Belfast in 1867, that "hospitals should be changed from " wards into rooms, from stately mansions into simple

“cottages, from stone and marble palaces into wooden, “ brick or iron villages,”\*

Dr. MacLeod, of Glasgow, in 1869, predicted that the “ future hospital would consist of small buildings “ placed among fields and gardens, and having all the “ aids to recovery which amusements, flowers and music “ could contribute.” He advised small houses of relief, scattered through a large city in order to provide for urgent cases needing succor immediately after an accident, or taken suddenly ill, as in sun-stroke. And he strongly condemned “ the present pile of courts and “ towers crowded into the heart of our great manufacturing cities, which forms the type of existing general “ hospitals.”\*

Should the village of cottage hospitals be built on the shore of the East or North rivers, as may readily be done, the difficulty of transportation will be less, and the conveyance would be a boat (itself a floating relief ward), which might be kept most of the day at the Battery, and could be towed by a steam tug to and from the village on the water side whenever patients were ready for removal. In case of boiler explosions, such as occur sometimes at the ferries, or when fires in the lower part of the city have crushed beneath falling walls many sufferers, such a relief station as the hospital transport would offer, might be of great value, for it could be towed promptly to any part of the water-front of the city where an accident had occurred.

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\* Hospitalism. Edinburgh, 1871, p. 291.

\* Douglas Galton. Construction of hospitals, London, 1869, p. 79.



It will be found that the cost of doing all these things will be no greater, when RENT is fairly computed, than the expense of treating an equal number of patients in existing city hospitals, whose architectural splendors have absorbed a large amount of capital which otherwise invested, is capable of doing good service.

The modest general hospital, which we approve, is likely to be of use to a larger number of inmates than may be anticipated. Sick people in a rural infirmary will be cured in half the usual time, so that the same beds will be available for many invalids during the same year.

The "post-mortems," however, will be few, and the pathologist may find but rare additions to his cabinet from such a healthful, simple and economical establishment for the relief of the sick poor as a village of cottage hospitals, properly managed, would afford.

Your committee recommend that after the completion of the building now in process of erection, in Fifteenth street, and its inauguration as an hospital, the plan for establishing a village of cottage hospitals indicated in this report be carried into effect on such a moderate scale as would be sufficient to test its merits without interfering with the ability of the society of the New York Hospital to carry on its other operations.

JAMES WILLIAM BEEKMAN,  
GEORGE CABOT WARD,  
ROBERT J. LIVINGSTON,

Committee.

New York, February 24, 1876.

# APPENDIX.

## NOTE A.

The three census returns of mortality in the United States, made in the years 1850, 1860 and 1870, very nearly agree in representing the percentage of deaths as about 1.30 of the population, as appears by the following table :

YEAR.	POPULATION.	DEATHS.	PERCENTAGE.
1850.....	23,191,876	323,093	1.39
1860.....	31,443,321	394,153	1.25
1870.....	38,555,983	492,263	1.28 *

Mr. Francis A. Walker, Superintendent of the Ninth Census (1870), is of opinion, however, that at no one " of the three censuses taken under the Act of May 23d, 1850, has the aggregate numbers of deaths returned by the assistant marshals risen above two-thirds of the number of deaths probably occurring during the year of enumeration, as that number is deduced from the experience of other countries, from the experience of sections of our own country having an established system of registration and from the established laws of national increase."

"The deficiency in the returns of deaths was assumed to be *forty-one* per cent. of the full number of deaths which must have taken place."

The number of deaths to each 1,000 living persons would be, at the ninth census :

Total native population.....	12.9
" Foreign " .....	11.8

or about 13 deaths out of each 1,000 persons.

But the Superintendent of the Census believes the true rate was 21 out of each thousand.

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\* Ninth Census, Vol. II, page 3, Vital Statistics of the United States.

The conclusions of Mr. Walker as to the inaccuracy of the United States census appear to rest upon estimates rather than facts, for, applying to the tables of which he complains, his own test, "the experience of other countries," it will be seen that similar difficulties occur in England.

The twenty-fourth report of the registrar-general, p. xli, states that the mortality of the whole population of Great Britain, inclusive of the army at home and abroad, is 21.4 per 1,000, or 2.14 per cent.

The mortality of the city of London, in the same year, 1861, was 2.32 per cent., apparently showing that the healthfulness of city and country were not very different.

Dr. Morgan, however, quoted in Am. Pub. Health Reports, page 123, states that in 1861-2 the mortality in twenty-seven agricultural districts was 2.1 per cent., and in the four chief cities 4.0 per cent.

The solution of this difficulty becomes easy when it is remembered that London includes so immense a territory that the population per square mile is comparatively small, as is shown by the following table :\*

TOWNS.	LIVING, TO SQUARE MILE.	ANNUAL DEATHS PER 1,000.
London.....	50,000	25.1
Leeds.....	87,256	27.2
Manchester.....	100,000	33.7
Liverpool.....	138,000	34.8

The twenty-fifth report of the registrar-general contains a statement with regard to the average number of deaths in proportion to the number of people to each acre of land, from which it appears that, in the districts which had one hundred to two hundred and fifty persons to each acre, the annual deaths were 26.2 to each 1,000 living. In thinly settled districts, with twelve or more acres for each, the deaths were only 16.8 in 1,000.

More than half (fifty-six per cent.) of the British nation live in cities. In America about fourteen per cent. only of our people inhabit cities or large towns. Is it probable that the mortality of this dense crowd can be the same with that of the sparse population of the rural districts?

\* Am. Pub. Health Association Reports, 1873, p. 123, p. 126, p. 134.

Again, the twenty-fifth English Registrar's Report, as quoted in the fifth annual report of the State Board of Health of Massachusetts, page 368, shows that where there were twenty to thirty-eight acres to a person, the death rate was one in sixty-two, or 1.6 per cent. This apparently confirms the accuracy of the three census reports, which give for a country far more thinly settled than any part of Great Britain an annual mortality of 1.30 per cent.

If eighty-six per cent. of the American people live in the country, and only fourteen per cent. in cities, we may be safe in giving to our rural population the rural death-rate found true in England, which we have seen is 1.6 per cent., or one in sixty-two. The city population has a mortality of 2.5 per cent. It is not clear, then, that the mortality of the *whole* United States, as computed by Mr. Walker, is really 2.16 per cent.

On the contrary, if six-sevenths of our people live under the English rural mortality of 1.6 per cent., and only one-seventh under the city rate of 2.5 per cent., it is evident that the average of the whole will be no higher than 1.7.

But, in fact, the density of population here is far less than in England, and the rural mortality is, therefore, probably much smaller.

The census takers were, therefore, not far wrong in their three decennial reports, which give, as the average of the three enumerations, a general mortality of 1.3 per cent.

J. W. B.









